

WE CLAIM:

1. An electrical signal filter, comprising:

a first filter housing member extending along a longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end;

a second filter housing member extending along said longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end, said second filter housing member abutting said first filter housing member at a junction between said first and second side surfaces of said second filter housing member and said first and second side surfaces of said first filter housing member, respectively, to thereby define an internal filter cavity;

a circuit board positioned within said filter cavity, said circuit board having at least one through-hole passing from a first surface thereof to an opposed second surface thereof, said at least one through-hole being plated with a conductive substance from said first surface of said circuit board to said second surface of said circuit board to form at least one plated ground hole passing through said circuit board from said first surface to said second surface thereof; and

at least one ground post extending away from said inner surface of said first filter housing member in a direction substantially perpendicular to said longitudinal direction, said at least one ground post having at least a first portion having an outer dimension that is greater than an inner diameter of said at least one plated ground hole;

wherein said circuit board is positioned within said filter cavity such that at least said first portion of said at least one ground post extends into said at least one plated ground hole to achieve secure ground contact between said circuit board and said first filter housing member in a solderless manner.

2. The electrical signal filter of claim 1, wherein said at least one ground post further comprises a second portion adjacent a first end of said first portion and having an outer dimension that is greater than said outer dimension of said first portion, and wherein at least a portion of said second surface of said circuit board contacts said second portion of said at least one ground post.

3. The electrical signal filter of claim 2, wherein said at least one ground post further comprises a third portion adjacent a second end of said first portion and having an outer dimension that is less than said outer dimension of said first portion, and wherein said third portion guides said plated ground hole in said circuit board onto said first portion of said at least one ground post.

4. The electrical signal filter of claim 1, wherein at least said first portion of said at least one ground post is polygonal or at least not substantially rounded.

5. The electrical signal filter of claim 4, wherein said first portion has a square cross-section.

6. The electrical signal filter of claim 1, further comprising two ground posts extending from opposite lateral sides of said inner surface of said first filter housing member and spaced a distance from one another in said longitudinal direction.
7. The electrical signal filter of claim 1, wherein an outer peripheral edge of said through-hole in said circuit board is spaced from an edge of said circuit board a distance substantially equal to at least one half a thickness dimension of said circuit board.
8. The electrical signal filter of claim 4, wherein at least one side of said first portion is arranged parallel to a side edge of said circuit board.
9. The electrical signal filter of claim 6, further comprising at least one shield member interposed between said two ground posts.
10. The electrical signal filter of claim 9, wherein said at least one shield member includes a surface arranged a height that is substantially the same as a height of said second portions of said ground posts to provide support for said circuit board.
11. The electrical signal filter of claim 1, wherein said at least one ground post is integrally formed with said first filter housing member.
12. The electrical signal filter of claim 11, wherein said at least one ground post is integrally cast as a part of said first filter housing member.

13. An electrical signal filter, comprising:

a first filter housing member extending along a longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end;

a second filter housing member extending along said longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end, said second filter housing member abutting said first filter housing member at a junction between said first and second side surfaces of said second filter housing member and said first and second side surfaces of said first filter housing member, respectively, to thereby define an internal filter cavity;

a circuit board positioned within said filter cavity, said circuit board having at least one through-hole passing from a first surface thereof to an opposed second surface thereof, said at least one through-hole being plated with a conductive substance from said first surface of said circuit board to said second surface of said circuit board to form at least one plated ground hole passing through said circuit board from said first surface to said second surface thereof;

at least one ground post extending away from said inner surface of said first filter housing member in a direction substantially perpendicular to said longitudinal direction, said at least one ground post having at least a first portion with an outer dimension that is greater than an inner diameter of said at least one plated ground hole; and

at least one second post member extending from a first end thereof away from said inner surface of said second filter housing member toward an opposed terminal end thereof in a direction substantially perpendicular to said longitudinal direction;

wherein said circuit board is positioned within said filter cavity such that said second post member exerts a force upon said first surface of said circuit board such that at least said first portion of said at least one ground post extends into said at least one plated ground hole to achieve secure electrical grounding contact between said circuit board and said first filter housing member in a solderless manner.

14. The electrical signal filter of claim 13, wherein said at least one ground post further comprises a second portion adjacent a first end of said first portion and having an outer dimension that is greater than said outer diameter of said first portion, and wherein at least a portion of said second surface of said circuit board contacts said second portion of said at least one ground post.

15. The electrical signal filter of claim 14, wherein said at least one ground post further comprises a third portion adjacent a second end of said first portion and having an outer dimension that is less than said outer dimension of said first portion, and wherein said third portion guides said plated ground hole in said circuit board onto said first portion of said at least one ground post.

16. The electrical signal filter of claim 13, wherein at least said first portion of said at least one ground post is polygonal.

17. The electrical signal filter of claim 16, wherein said first portion has a square cross-section.
18. The electrical signal filter of claim 13, wherein an outer peripheral edge of said through-hole in said circuit board is spaced from an edge of said circuit board a distance substantially equal to at least one half a thickness dimension of said circuit board.
19. The electrical signal filter of claim 17, wherein at least two sides of said first portion are arranged parallel to at least one edge of said circuit board.
20. The electrical signal filter of claim 14, comprising two of said ground posts extending from opposite lateral sides of said inner surface of said first filter housing member and spaced a distance from one another in said longitudinal direction.
21. The electrical signal filter of claim 20, further comprising at least one shield member interposed between said two ground posts.
22. The electrical signal filter of claim 21, wherein said at least one shield member includes a surface arranged at a height that is substantially equal to a height of said second portion of each said ground post to provide support for said circuit board.
23. The electrical signal filter of claim 13, wherein said at least one ground post is integrally formed with said first filter housing member.

24. The electrical signal filter of claim 23, wherein said at least one ground post is integrally cast as a part of said first filter housing member.

25. The electrical signal filter of claim 13, wherein said at least one second post member is integrally formed with said second filter housing member.

26. The electrical signal filter of claim 25, wherein said at least one second post member is integrally cast as a part of said second filter housing member.

27. The electrical signal filter of claim 13, wherein said at least one second post member is substantially coaxial with said at least one ground post.

28. The electrical signal filter of claim 27, wherein said terminal end of said at least one second post member further comprises a recess having an inner dimension sufficient to receive a third portion of said at least one ground post in a press-fit manner.

29. The electrical signal filter of claim 13, wherein said terminal end of said at least one second post member is spaced from a second portion of said at least one ground post a distance substantially equal to a thickness dimension of said circuit board.

30. An electrical signal filter, comprising:

a first filter housing member extending along a longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end;

a second filter housing member extending along said longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end, said second filter housing member abutting said first filter housing member at a junction between said first and second side surfaces of said second filter housing member and said first and second side surfaces of said first filter housing member, respectively, to thereby define an internal filter cavity;

a circuit board positioned within said filter cavity, said circuit board having at least one through-hole passing from a first surface thereof to an opposed second surface thereof, at least a portion of said circuit board proximate said through-hole being plated with a conductive substance to form a ground terminal; and

at least one ground post extending away from said inner surface of said first filter housing member in a direction substantially perpendicular to said longitudinal direction, said at least one ground post having at least a first portion having an outer dimension that is greater than an inner diameter of said at least one through-hole;

wherein said circuit board is positioned within said filter cavity such that said first portion of said at least one ground post extends into said through-hole and contacts said ground terminal to achieve secure ground contact between said circuit board and said first filter housing member in a solderless manner.

31. The electrical signal filter of claim 30, wherein said ground terminal is formed on said second surface of said circuit board.

32. The electrical signal filter of claim 30, wherein said first portion of said ground post further comprises a plurality of projected edges extending outwardly toward a second portion of said ground post.

33. The electrical signal filter of claim 32, wherein said plurality of projected edges engage a planar surface of said ground terminal to achieve a secure ground contact between said circuit board and said first filter housing member in a solderless manner.

34. An electrical signal filter, comprising:

a first filter housing member extending along a longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end;

a second filter housing member extending along said longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end, said second filter housing member abutting said first filter housing member at a junction between said first and second side surfaces of said second filter housing member and said first and second side surfaces of said first filter housing member, respectively, to thereby define an internal filter cavity;

a circuit board positioned within said filter cavity, said circuit board having at least one through-hole passing from a first surface thereof to an opposed second surface thereof, at least a portion of said circuit board proximate said through-hole being plated with a conductive substance to form a ground terminal;

at least one ground post extending away from said inner surface of said first filter housing member in a direction substantially perpendicular to said longitudinal direction, said at least one ground post having at least a first portion having an outer dimension that is greater than an inner diameter of said at least one through-hole; and

at least one second post member extending from a first end thereof away from said inner surface of said second filter housing member toward an opposed terminal end thereof in a direction substantially perpendicular to said longitudinal direction;

wherein said circuit board is positioned within said filter cavity such that said first portion of said at least one ground post extends into said through-hole and contacts said ground terminal to achieve secure ground contact between said circuit board and said first filter housing member in a solderless manner.

35. The electrical signal filter of claim 34, wherein said ground terminal is formed on said first and said second surfaces of said circuit board.

36. The electrical signal filter of claim 34, wherein said first portion of said ground post further comprises a plurality of projected edges extending outwardly toward a second portion of said ground post.

37. The electrical signal filter of claim 36, wherein said plurality of projected edges engage a planar surface of said ground terminal on said second surface of said circuit board to achieve a secure ground contact between said circuit board and said first filter housing member in a solderless manner.

38. The electrical signal filter of claim 37, wherein said at least one second post member is substantially coaxial with said at least one ground post.

39. The electrical signal filter of claim 38, wherein said terminal end of said at least one second post member further comprises a recess having an inner dimension sufficient to receive a third portion of said at least one ground post in a press-fit manner.

40. The electrical signal filter of claim 39, wherein said terminal end of said at least one second post member further comprises a plurality of projected portions extending outwardly and away from said second filter housing member.

41. The electrical signal filter of claim 40, said plurality of projected portions engage a planar surface of said ground terminal on said first surface of said circuit board to achieve a secure ground contact between said circuit board, said ground post and said second filter housing member in a solderless manner.

42. An electrical signal filter, comprising:

a first filter housing member extending along a longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end;

a second filter housing member extending along said longitudinal direction from a first end thereof to an opposed second end thereof, and having an inner surface terminating at first and second side surfaces that extend from said first end to said second end, said second filter housing member abutting said first filter housing member at a junction between said first and second side surfaces of said second filter housing member and said first and second side surfaces of said first filter housing member, respectively, to thereby define an internal filter cavity;

a circuit board positioned within said filter cavity, said circuit board having at least one through-hole passing from a first surface thereof to an opposed second surface thereof, at least a portion of said first surface of said circuit board being plated with a conductive substance to form a ground terminal proximate said through-hole;

at least one ground post extending away from said inner surface of said first filter housing member in a direction substantially perpendicular to said longitudinal direction, said at least one ground post having at least a first portion having an outer dimension that is greater than an inner diameter of said at least one through-hole; and

at least one second post member extending from a first end thereof away from said inner surface of said second filter housing member toward an opposed terminal end thereof in a direction substantially perpendicular to said longitudinal direction;

wherein said circuit board is positioned within said filter cavity such that said first portion of said at least one ground post extends into said through-hole and contacts said ground terminal to achieve secure ground contact between said circuit board and said first filter housing member in a solderless manner.

43. The electrical signal filter of claim 42, wherein said at least one second post member is substantially coaxial with said at least one ground post.

44. The electrical signal filter of claim 43, wherein said terminal end of said at least one second post member further comprises a recess having an inner dimension sufficient to receive a third portion of said at least one ground post in a press-fit manner.

45. The electrical signal filter of claim 44, wherein said terminal end of said at least one second post member further comprises a plurality of projected portions extending outwardly and away from said second filter housing member.

46. The electrical signal filter of claim 45, said plurality of projected portions engage a planar surface of said ground terminal on said first surface of said circuit board to achieve a secure ground contact between said circuit board, said ground post and said second filter housing member in a solderless manner.